

CLAIMS

*Copy
part of Patent #1*

We claim:

- 1 A system for programming application programs controlling a programmable logic controller from a communication network, comprising:
 - 5 a. an interface module for coupling the programmable logic controller to the communication network;
 - b. a program editor resident in the programmable logic controller, the program editor for creating and editing the application programs;
 - c. at least one Web page resident in the programmable logic controller, the Web page linked to the program editor;
 - 10 d. wherein the Web page is accessible to a user at a remote location using a web browser coupled to the communication network through the interface module; and
2. The system of claim 1 further including wherein the application programs are viewed as files within the programmable logic controller, accessible to the communication network using a standard File Transfer Protocol.
 - e. wherein the Web page allows the user at the remote location to access the program editor to edit the application programs controlling the programmable logic controller.
3. The system of claim 1 wherein the application programs are viewed as files within the programmable logic controller, accessible to the communication network using a standard File Transfer Protocol.
4. The system of claim 1 wherein the application programs are converted by the programming package and viewed on a web browser through either Java or HTML.
5. The system of claim 1 wherein the interface module includes a real time operating system operating a central processing unit, a network interface for communicating with the communication network, a driver for communicating with the programmable logic controller, a protocol stack, a client task for communicating with the protocol stack for initiating received requests,

a server task for communicating with the protocol stack for responding to received requests, and

a protocol task for communicating with the protocol stack for receiving and responding to protocol task requests.

- 5 6. The system of claim 5 wherein the communication network is a world-wide network known as the Internet using an Internet Protocol (IP).
7. The system of claim 6 wherein the interface module functions as a web site on the Internet, the interface module including a global IP address.
8. The system of claim 7 wherein the protocol stack is a Transmission Control
10 Protocol stack and wherein the protocol task includes a server task using a hypertext transport protocol (HTTP) task to deliver hypertext documents to the network interface.
9. The system of claim 8 wherein the HTTP task accepts a connection, parses an HTTP request, and calls the real time operating system to process the request.
- 15 10. The system of claim 9 wherein the interface module further includes a dual TCP/IP stack for data transferring comprising a first stack capable of handling a broad range of TCP/IP messages and a second stack capable of handling a less broad range of TCP/IP messages more quickly than the first stack.
11. A system for programming application programs controlling a programmable
20 logic controller from a communication network, comprising:
 - a. means for coupling the programmable logic controller to the communication network;
 - b. means resident in the programmable logic controller for creating and editing the application programs;
 - 25 c. at least one Web page resident in the programmable logic controller, the Web page linked to the creating and editing means resident in the programmable logic controller;
 - d. wherein the Web page is accessible to a user at a remote location using a web browser coupled to the communication network through the
30 coupling means; and
2. The system of claim 1 further including wherein the application programs are viewed as files within the programmable logic controller, accessible to the communication network using a standard File Transfer Protocol.
 - e. wherein the Web page allows the user at the remote location to access
35 the creating and editing means to edit the application programs controlling the programmable logic controller.

12. The system of claim 11 wherein the application programs are viewed as files within the programmable logic controller, accessible to the communication network using a standard File Transfer Protocol.
13. The system of claim 11 wherein the creating and editing means includes a programming package whereby the application programs are converted by the programming package and viewed as either Java or HTML.
14. The system of claim 13 wherein the programming package further includes symbol editors and language editors and wherein all symbols are stored within the programmable logic controller, allowing any authorized personal computer coupled to the communication network to edit the application programs.
15. The system of claim 11 wherein the coupling means includes an interface module, the interface module including
a real time operating system operating a central processing unit,
a network interface for communicating with the communication network,
a driver for communicating with the programmable logic controller,
a protocol stack,
a client task for communicating with the protocol stack for initiating received requests,
a server task for communicating with the protocol stack for responding to received requests, and
a protocol task for communicating with the protocol stack for receiving and responding to protocol task requests.
16. The system of claim 15 wherein the communication network is a world-wide network known as the Internet using an Internet Protocol (IP).
17. The system of claim 16 wherein the interface module functions as a web site on the Internet, the interface module including a global IP address.
18. The system of claim 17 wherein the protocol stack is a Transmission Control Protocol stack and wherein the protocol task includes a server task using a hypertext transport protocol (HTTP) task to deliver hypertext documents to the network interface.
19. The system of claim 18 wherein the HTTP task accepts a connection, parses an HTTP request, and calls the real time operating system to process the request.
20. The system of claim 19 wherein the interface module further includes a dual TCP/IP stack for data transferring comprising a first stack capable of handling a broad range of TCP/IP messages and a second stack capable of handling a less broad range of TCP/IP messages more quickly than the first stack.